

REMARKS

In the Action, claims 1-9 are rejected. In response, claims 1, 4 and 7 are amended, and claims 2, 5 and 8 are cancelled. New claim 10 is added to depend from claim 7. The pending claims in this application are claims 1, 3, 4, 6, 7, 9 and 10, with claims 1, 4 and 7 being independent.

Claim 7 is amended to clarify that only the alkylene oxide addition product obtained from the molar-degree-of-the-polyaddition-adjusting step is used in the esterification reaction or transesterification reaction. This amendment is submitted to overcome the rejection under 35 U.S.C. § 112, second paragraph.

Claims 1, 4 and 7 are amended to include the subject matter of original claims 2, 5 and 8, respectively. As amended, the claims recite the hydroxyl-group-containing saturated compound having a water content of not more than 6,000 ppm, and the amount of the alkylene oxide used in the molar-degree-of-polyaddition-adjusting step being not larger than 20 moles on average per 1 mole of the alkylene oxide low mol addition product. Support for this feature is found on page 12, lines 26-28 of the specification.

Furthermore, claims 1, 4 and 7 are amended to replace the word “portion” with “part” to clarify not including the entire amount.

New claim 10 is directed to an admixture for cement comprising the (meth)acrylic copolymer obtained by the process of claim 7. Support for claim 10 is found on page 49, lines 21-23 of the specification. Accordingly, the amendments are supported by the specification and claims as originally filed.

The specification is amended to correct an obvious clerical error. Example 9 should refer to the copolymer obtained according to Example 8 since Example 8 uses the L-ascorbic acid. Example 1 does not use the L-ascorbic acid. The specification is revised to correct this inadvertent error.

In view of these amendments and the following comments, reconsideration and allowance are requested.

Rejection Under 35 U.S.C. § 102

Claims 1-9 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,174,980 to Hirata et al. Hirata et al. is cited for allegedly disclosing each of the claimed features of the invention.

As amended, claims 1, 4 and 7 are not anticipated since Hirata et al. does not disclose or suggest the claimed process of reacting an alkylene oxide with a “hydroxyl-group-containing saturated compound”. The Example 1 in column 9, line 64 to column 10, line 25 of Hirata et al. referred to in the Action reacts ethylene oxide with 3-methyl-3-butene-1-ol. The hydroxyl-group-containing compound disclosed in Example 1 of Hirata et al. is unsaturated and is not a saturated hydroxyl-group-containing compound as recited in the claims. Accordingly, Hirata et al. does not anticipate the claims.

Furthermore, the amount of the ethylene oxide reacted with the first addition product of Hirata et al. (referred to as IPN-10) in the second step is 25 moles of ethylene oxide per mol of the IPN-10. As amended, the independent claims recite the amount of the alkylene oxide used in the molar-degree-of-polyaddition-adjusting step being not larger than 20 moles of the alkylene oxide on average per mole of the alkylene oxide low-mole-addition product. Thus, the amount of the ethylene oxide disclosed in Example 1 of Hirata et al. is outside the claimed range of not larger than 20 moles on average per mole of the alkylene oxide low-mole-addition product, so that the claims are not anticipated.

The claims also specifically recite the amount of the hydroxyl-group-containing saturated compound having a water content of not more than 6,000 ppm. Hirata et al. is silent regarding the water content, and thus, does not anticipate the claims.

The other Example of Hirata et al. also do not anticipate the claims as amended. For example, Example 3 of Hirata et al. does not disclose removing part of the first addition product from the reaction before the second addition step is carried out by the addition of the alkylene oxide. The amount of the ethylene oxide reacted with the first addition product in the second step is 22 moles per mole of the first addition product. Thus, the amount of the ethylene oxide added to the second addition step is outside the claimed range of not larger than 20 moles. The water content of the hydroxyl-group-containing compound (i.e. the methanol) is not disclosed in Example 3 of Hirata et al. Example 6 of Hirata et al. also does not disclose the claimed features of the invention since the methacrylate is a product obtained from Example 3 of Hirata et al.

The effects of the water content of the hydroxyl-group-containing compound and the amount of the alkylene oxide used in the molar-degree-of-polyaddition-adjusting step are unexpected to one skilled in the art. As disclosed on page 9, lines 12-20 of the specification the water content of the hydroxyl compound of not more than 6,000 ppm can better suppress the formation of by-products such as poly(alkylene oxide) in the initial step. At the same time the controlling the amount of water can better suppress the formation of by-products such as the poly(alkylene oxide) in the subsequent molar-degree-of-polyaddition-adjusting step.

As disclosed on page 12, line 26 to page 13, line 4, the amount of the alkylene oxide used the second addition step enable the volume of the reaction products to be controlled. An amount of the alkylene oxide larger than 20 moles per mole of the low-mole-addition product results in an increase volume to require special reactors or stirring apparatus. Although ordinary facilities can be used with a decreased charge of the low-mole-addition product, the residual water in the system is so large that the amount of by-products such as the poly(alkylene oxide) is increased.

The effects of these features are also demonstrated by the Examples in the specification. For example, Example 1 which corresponds to claim 1 includes the extraction of part of the low-

mole-addition product prior to reaction with the alkylene oxide in the second step, the claimed amount of the alkylene oxide added in the second addition step, and the water content of the hydroxyl compound exhibited a formation of the by-product PEG of only 0.45 wt%. In contrast, Comparative Example 1 which does not satisfy the claimed step of reacting only a part of the low-mole-addition product or the amount of the alkylene oxide addition in the second addition step resulted in an amount of PEG of 2 wt%, which is greater than the amount obtained according to the claimed invention. Comparative Example 4 which also does not use only a part of the low-mole-addition product, the amount of water in the hydroxyl compound and the amount of the alkylene oxide added in the second addition step resulted in an amount of PEG of 6.7 wt%. Thus, the examples in the specification demonstrate the advantages of the claimed process which would not be expected by one skilled in the art.

In view of the above comments independent claims 1, 4 and 7 are not anticipated by Hirata et al. Claims 3, 6 and 9 are also not anticipated since they depend from an allowable base claim.

Claim 10 is also allowable over the art of record for reciting an admixture for cement using the copolymer obtained according to the process of claim 7. As disclosed in Table 1 on page 63 of the specification, the composition of the claimed invention has an improved flow value over time. As shown in Table 1, for example, the mortar of Example 10 to which the aqueous copolymer solution (1) (as obtained in Example 3) had been added, which corresponds to the claimed invention, exhibited an initial higher flowability, and the change in the flow value with the passage of time was smaller, when compared to the mortars of Comparative Examples 7 and 8 to which the comparative aqueous copolymer solutions (1) and (2) (as obtained in Comparative Examples 3 and 6), respectively, has been added, which do not correspond to the claimed invention. Thus, the results of Table 1 show the aqueous copolymer solution (1) according to the claimed invention provides an improved admixture for cement compared with

the comparative aqueous copolymer solutions (1) and (2) not according to the claimed invention.

Accordingly, claim 10 is allowable over the art of record.

In view of these amendments and the above comments, reconsideration and allowance are requested.

Respectfully submitted,



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Dated: Sept 4, 2007